Listing of the Claims:

1. (Currently amended) A steering control device for use in a vehicle having a steering wheel that receives steering input, and an electronically-controlled steering unit that turns the vehicle's wheels over a road surface based on the position of the steering wheel, comprising:

a reaction force device coupled to the steering wheel and responsive to a control signal to apply a steering reaction force to the steering wheel, the control signal calculated based on a formula including a plurality of terms, the plurality of terms including at least a steering angle term, a steering angle velocity term and a steering angle acceleration term;

a hands-free sensor adapted to generate a signal indicative of whether the steering wheel is in a hands-on state or a hands-off state; and

a controller adapted to vary the control signal in response to the hands-free sensor signal to reduce the steering reaction force applied when the hands-off state is indicated relative to the steering reaction force applied when the hands-on state is indicated by using a value of at least one of a coefficient and a gain for a term in the formula when the hands-off state is indicated that is different from a value used when the hands-on state is indicated.

2. (Currently amended) The steering control device of claim 1, further comprising:

a road surface reaction force sensor adapted to generate a signal indicative of road surface reaction force, ~~wherein the reaction force device is further adapted to apply the steering reaction force corresponding to the indicated~~ the formula including a road surface reaction force term based the road surface reaction force; and wherein the controller is further adapted to reduce the steering reaction force corresponding to the indicated road surface reaction force when the hands-off state is indicated by using the value of least one of a road surface reaction force coefficient and a road surface reaction force gain in the road surface reaction force term when the hands-off state is indicated that is different from the value used in the road surface reaction force term when the hands-on state is indicated.

3. (Currently amended) The steering control device of claim 1, further comprising:

a steering angle detection sensor adapted to generate a signal indicative of ~~the~~ a steering angle of the steering wheel; ~~wherein the steering reaction force device is further adapted to apply a steering reaction force corresponding to the steering angle;~~ and wherein the controller is further adapted to reduce the reaction force corresponding to the ~~indicated~~ steering angle when the hands-off state is indicated by using the value of least one of a steering angle coefficient based on a steering torque and a steering angle gain in the steering angle term when the hands-off state is indicated that is different from the value used in the steering angle term when the hands-on state is indicated.

4. (Currently amended) The steering control device of claim 1, further comprising:

a steering angle acceleration detection sensor adapted to generate a signal indicative of ~~the~~ a steering angle acceleration; ~~wherein the steering reaction device applies a steering reaction force corresponding to the indicated steering angle acceleration;~~ and wherein the controller is further adapted to reduce the reaction force corresponding to the ~~indicated~~ steering angle acceleration when the hands-off state is indicated by using the value of least one of a steering angle acceleration coefficient based on a steering torque and a steering angle acceleration gain in the steering angle acceleration term when the hands-off state is indicated that is different from the value used in the steering angle acceleration term when the hands-on state is indicated.

5. (Currently amended) The steering control device of claim 1, further comprising:

a steering angle velocity detection sensor adapted to generate a signal indicative of the steering angle velocity; ~~wherein the steering reaction device applies a steering reaction force corresponding to the indicated steering angle velocity;~~ and wherein the controller is further adapted to reduce the reaction force corresponding to the ~~indicated~~

steering angle velocity when the hands-off state is indicated by using the value of least one of a steering angle velocity coefficient based on a steering torque and a steering angle velocity gain in the steering angle velocity term when the hands-off state is indicated that is different from the value used in the steering angle velocity term when the hands-on state is indicated.

6. (Currently amended) The steering control device of claim 1, further comprising:

a steering torque detection sensor adapted to generate a signal indicative of steering torque; and wherein the ~~controller is further adapted to reduce the reaction force when the indicated steering torque decreases and the hands-off state is not indicated~~ value of the at least one of the coefficient and the gain is based on the steering torque.

7. (Currently amended) A vehicle having road wheels, comprising:

a steering unit;

an electronically-controlled turning unit responsive to the steering unit ~~which~~ that turns the road wheels based on ~~the~~ a position of the steering unit;

a steering reaction force applicator adapted for applying a steering reaction force to the steering unit, the steering reaction force responsive to a control signal calculated based on a formula including a plurality of terms, the plurality of terms including at least a steering angle term, a steering angle velocity term and a steering angle acceleration term;

a hands-free sensor adapted for detecting whether the steering unit is in a hands-off state or a hands-on state; and

a steering reaction force correction component adapted for reducing the steering reaction force applied when the hands-off state is detected relative to the steering reaction force applied when the hands-on state is detected by using a value of at least one of a coefficient and a gain for a term in the formula when the hands-off state is detected that is different from a value used when the hands-on state is detected.

8. (Currently amended) The vehicle of claim 7, further comprising:

a road surface reaction force sensor adapted for detecting the road surface

reaction force~~; wherein the steering reaction force applicator applies a steering reaction force corresponding to~~, formula including a road surface reaction force term based on the road surface reaction force; and wherein the steering reaction force correction component reduces the steering reaction force corresponding to the road surface reaction force when the steering unit is in the hands-off state by using a value of least one of a road surface reaction force gain and a road surface reaction force coefficient in the road surface reaction force term when the hands-off state is detected that is different from the value used in the road surface reaction force term when the hands-on state is detected.

9. (Currently amended) The vehicle of claim 7, further comprising:

a steering angle detection sensor for detecting ~~the~~ a steering angle of the steering ~~wheel~~ unit; ~~wherein the steering reaction force applicator applies a steering reaction force corresponding to the steering angle;~~ and wherein the steering reaction force correction component reduces the steering reaction force corresponding to the steering ~~angles~~ angle when the hands-off state is detected by using the value of least one of a steering angle coefficient based on a steering torque and a steering angle gain in the steering angle term when the hands-off state is detected that is different from the value used in the steering angle term when the hands-on state is detected.

10. (Currently amended) The vehicle of claim 7, further comprising:

a steering angle acceleration detection sensor for detecting the steering angle acceleration; ~~wherein the steering reaction force applicator applies a steering reaction force corresponding to the steering angle acceleration;~~ and wherein the steering reaction force correction component reduces the steering reaction force corresponding to the steering ~~angles~~ angle acceleration when the hands-off state is detected, ~~but reference steering angle acceleration~~ by using the value of least one of a steering angle acceleration coefficient based on a steering torque and a steering angle acceleration gain in the steering angle acceleration term when the hands-off state is detected that is different from the value used in the steering angle acceleration term when the hands-on state is detected.

11. (Currently amended) The vehicle of claim 7, further comprising:

a steering angle velocity detection sensor adapted for detecting ~~the~~ a steering angle velocity; ~~wherein the steering reaction force applicator applies a steering reaction force corresponding to the steering angle velocity,~~ and wherein the steering reaction force correction component reduces the steering reaction force corresponding to the steering angle velocity when the hands-off state is detected by using the value of least one of a steering angle velocity coefficient based on a steering torque and a steering angle velocity gain in the steering angle velocity term when the hands-off state is detected that is different from the value used in the steering angle velocity term when the hands-on state is detected.

12. (Currently amended) The vehicle of claim 7, further comprising:

a steering torque detection sensor adapted for detecting steering torque; wherein the value of the at least one of the coefficient and the gain is based on ~~steering reaction force correction component reduces the steering reaction force when~~ the steering torque ~~becomes smaller if the hands-off state is not detected~~.

13. (Currently amended) A ~~vehicle~~ device for controlling road wheels of ~~the~~ a vehicle comprising:

means for turning the road wheels in response to a steering input of a steering unit;

means for applying a steering reaction force to the steering unit, the steering reaction force responsive to a control signal calculated based on a formula including a plurality of terms, the plurality of terms including at least a steering angle term, a steering angle velocity term and a steering angle acceleration term;

means for detecting whether the steering unit is in a hands-on or hands-off state; and

means for reducing the steering reaction force in the hands-on state when the hands-off state is detected by using a value of at least one of a coefficient and a gain for a term in the formula when the hands-off state is detected that is different from a value used when the hands-on state is detected.

14. (Currently amended) A method for controlling the road wheels of a vehicle comprising:

turning the road wheels from a steering input via a steering unit;

applying a steering reaction force to the steering unit, the steering reaction force responsive to a control signal calculated based on a formula including a plurality of terms, the plurality of terms including at least a steering angle term, a steering angle velocity term and a steering angle acceleration term;

detecting whether the steering unit is in a hands-on or hands-off state; and

reducing the steering reaction force applied when the hands-off state is detected relative to the steering reaction force applied when the hands-on state is detected by using a value of at least one of a coefficient and a gain for a term in the formula when the hands-off state is detected that is different from a value used when the hands-on state is detected.

15. (Currently amended) The method of claim 14, further comprising;

detecting a road surface reaction force, wherein the formula includes a road surface reaction force term based on the road surface reaction force;

~~applying a steering reaction force to the steering unit corresponding to the road surface reaction force;~~ and

reducing the steering reaction force corresponding to the road surface reaction force when the hands-off state is detected by using a value of least one of a road surface reaction force gain and a road surface reaction force coefficient in the road surface reaction force term when the hands-off state is detected that is different from the value used in the road surface reaction force term when the hands-on state is detected.

16. (Currently amended) The method of claim 14, further comprising:

detecting ~~the~~ a steering angle;

~~applying the steering reaction force to the steering unit corresponding to the steering angle;~~ and

reducing the steering reaction force corresponding to the steering angle when the hands-off state is detected by using the value of least one of a steering angle coefficient based on a steering torque and a steering angle gain in the steering angle term when the hands-off state is detected that is different from the value used in the steering angle term when the hands-on state is detected.

17. (Currently amended) The method of claim 14, further comprising:

detecting ~~the~~ a steering angle acceleration;

~~applying the steering reaction force to the steering unit corresponding to the steering angle acceleration;~~ and

reducing the steering reaction force corresponding to the steering angle acceleration when the hands-off state is detected by using the value of least one of a steering angle acceleration coefficient based on a steering torque and a steering angle acceleration gain in the steering angle acceleration term when the hands-off state is detected that is different from the value used in the steering angle acceleration term when the hands-on state is detected.

18. (Currently amended) The method of claim 14, further comprising:

detecting ~~the~~ a steering angle velocity;

~~applying the steering reaction force to the steering unit corresponding to the steering angle velocity;~~ and

reducing the steering reaction force corresponding to the steering angle velocity when the hands-off state is detected by using the value of least one of a steering angle velocity coefficient based on a steering torque and a steering angle velocity gain in the steering angle velocity term when the hands-off state is detected that is different from the value used in the steering angle velocity term when the hands-on state is detected.

19. (Currently amended) The method of claim 14, further comprising:

detecting ~~the~~ a steering torque;

~~applying the steering reaction force to the turning means corresponding to the~~

~~steering torque; and~~

~~reducing the steering reaction force corresponding to the steering torque when the hands-off state is detected~~ wherein the value of the at least one of the coefficient and the gain is based on the steering torque.